UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,521	09/16/2003	Michael E. Farmer	65858-0020	1892

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EXAMINER
BITAR, NANCY

ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/663,521	FARMER ET AL.
	Examiner	Art Unit	
	Nancy Bitar	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>16 September 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

     4a) Of the above claim(s) *21-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>16 September 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/26/2004</u>.

4)☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Group 1, claim(s) 1-20, drawn to an image segmentation system

classified in 382/173.

Group 2, claim(s) 21-24, drawn to automated vehicle safety restraint system

classified in 701/45.

Inventions group 1 (claims 1-20) and group 2 (claims 21-24) are related as

combination and subcombination. Inventions in this relationship are distinct if it can be

shown that (1) the combination as claimed does not require the particulars of the

subcombination as claimed for patentability, and (2) that the subcombination has utility

by itself or in other combinations (MPEP § 806.05(c)).

The examiner has required restriction between combination and subcombination

inventions. Where applicant elects a subcombination, and claims thereto are

subsequently found allowable, any claim(s) depending from or otherwise requiring all

the limitations of the allowable subcombination will be examined for patentability in

accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if

any claim presented in a continuation or divisional application is anticipated by, or

includes all the limitations of, a claim that is allowable in the present application, such

claim may be subject to provisional statutory and/or nonstatutory double patenting

rejections over the claims of the instant application.

Election by telephone

2.   During a telephone conversation with Mr. Michael Stewart on 11/27/2006 a

provisional election was made **with** traverse to prosecute the invention of " System and

Method for identifying a region of interest in an Image", claims 1-20.

Affirmation of this election must be made by applicant in replying to this Office

action. Claims 21-24 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marques

et al (US 6,130,964) in view of Owechko et al. (US 6,801662).

4.   As to claim 1, Marques teaches a method for identifying a region-of-interest in an

ambient image, comprising: establishing a template image (image, I (t-1)); performing a

de-correlation heuristic on the ambient image and the template image to obtain an initial

segmented image (a segmentation step for defining the regions of a first coarse partition

P (t-1) of an image I (t-1) and, from said coarse partition P (t-1) and on the basis of a

spatial homogeneity criterion, a finer partition FP (t-1), column 1, lines 9-13); invoking a

watershed heuristic on the initial segmented image; and generating a revised

segmented image after invoking the watershed heuristic (re-segmentation 20 of the partition P(t-1) of the previous image into the current image, column 4, lines 60-61).

While Marques meets a number of the limitations of the claimed invention, as pointed out more fully above, Marques fails to specifically teach performing a de-correlation heuristic on the ambient image and the template image. Specifically, Owechko et al. teaches in figure 2 depicting a region of interest in an image (ambient) where image 200 is portioned into area 220 where an occupant is likely to be present and 215 where an occupant is likely not to be present with respect to a threshold algorithm; then an image variance computed in N successive frames is used to build a DMA that is updates (revised) when a new frame is acquired (column 6, lines 34-61). It would have been obvious to one of ordinary skill in the art to apply the algorithm on the ambient image in Marques watershed algorithm in order to get a fast and reliable system for detecting and recognizing occupants in vehicles for use in conjunction with vehicle air bag deployment system. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Marques teaches the method of claim 1, wherein the revised segmented image is purposefully under-segmented (re-segmentation 20).

As to claim 3, Owechko et al. teaches the method of claim 1, wherein the revised segmented image is used by an airbag deployment application to make a deployment decision (column 3 lines 25-51, the decision includes an enable / disable decision).

As to claim 4, Marques teaches the method of claim 1, further comprising: selecting the template image from a plurality of template images; and comparing the selected template image and the ambient image (a motion estimation operation between the images I (t-1) and I'(t), column 3, lines 14-15, see also Owechko et al.).

As to claim 5, Marques teaches the method of claim 4, wherein the plurality of template images relate to different light conditions (figure 4-7, area in light and dark grey in the image, see also Owechko et al. column 5, lines 14-27).

As to claim 6 and 7, Owechko et al. teaches the method of claim 1, wherein performing the de-correlation heuristic includes creating a plurality of map includes at least two of a gradient map, a de-correlation map, and a threshold map for obtaining the initial segmented image (range map module 110, motion density map 132, edge map 142, column 5 lines 29-44).

As to claim 8, Marques teaches the method of claim 1, wherein invoking the watershed heuristic includes preparing a marker (the selected markers are grown in the current image using an extension of the basic watershed algorithm, column 7, lines 22-30).

As to claim 9, Marques teaches the method of claim 1, wherein invoking the watershed heuristic includes preparing a contour (this extended watershed algorithm uses as cost function a combination of the texture and contour information of the region, column 7, lines 38-46, see also Owechko et al. (edge detection, column 8, lines 1-67)

As to claim 10, Marques teaches the method of claim 1, wherein invoking the watershed heuristic includes updating a marker map (figure 11 shows the set of projected markers after the gradient based cleaning operation, column 7, lines 9-15).

As to claim 11,Marques teaches the method of claim 1, further comprising performing a subsequent segmentation heuristic on the revised segmented image and generating a final segmented image (in order to obtain the final partition P (t), the selected markers are grown in the current image using an extension of the basic watershed algorithm, column 7, lines 26-31).

Claims 12-20 differ from claims 1-11 only in that claims 1-11 are a method claims whereas, claims 12-20 are apparatus claims. Thus, claims 12-20 are analyzed as previously discussed with respect to claims 1-11 above.

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Farmer et al (US 7,116,800) is cited to teach image segmentation system and method used to isolate the segmented image and the area surrounding the target.

Breed et al (2003/0125855) is cited to teach detecting the presence, type and/or position of occupants in vehicles and objects exterior of vehicles, e.g., in a driver's blind

spot, primarily using optics and determining a distance between objects in an environment in and outside of a vehicle by image processing techniques

Breed et al (US 2005/0131607) is cited to teach method for obtaining information about a vehicle occupant in a compartment of the vehicle in which a light source is mounted in the vehicle, structured light is projected into an area of interest in the compartment, rays of light forming the structured light originating from the light source, reflected light is detected at an image sensor at a position different than the position from which the structured light is projected, and the reflected light is analyzed relative to the projected structured light to obtain information about the area of interest. The structured light is designed to appear as if it comes from a source of light (virtual or actual), which is at a position different than the position of the image sensor
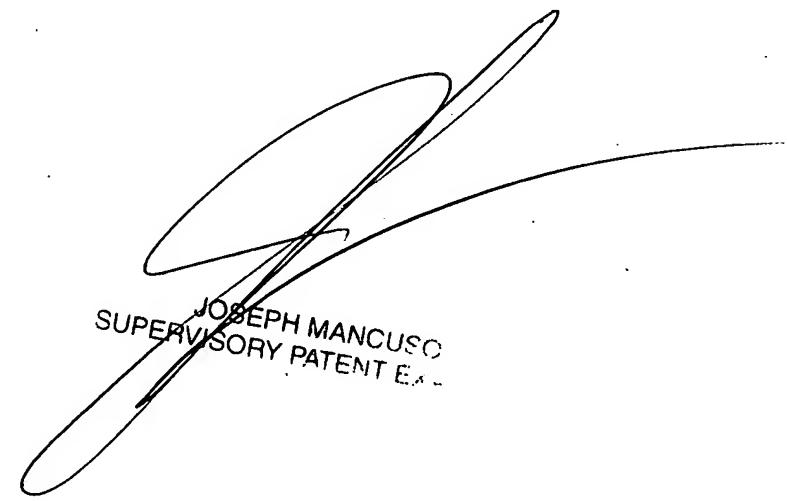
Inquiries

6.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar   11/27/2006

SUPERVISORY PATENT EX...
JOSEPH MANCUSO